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Detroit Arsenal Robotics Center of Excellence Features Five Cutting-Edge Robots at VIP Demonstration

DETROIT ARSENAL, WARREN, MI – On Aug. 11, 2008, the U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC) hosted the First Annual Robotics Life Cycle Conference kickoff with a VIP Demo. More than 250 industry leaders, engineers, young entrepreneurs and members of the media gathered to see cutting-edge robotic technologies. Attendees had the opportunity to meet industry leaders, see robotics demonstrations and receive overviews about unmanned ground vehicles (UGVs) envisioned for Future Combat Systems (FCS).

TARDEC Director Dr. Grace M. Bochenek, TARDEC Joint Robotics Center Director Dr. Jim Overholt and Robotic Systems Joint Project Office Project Manager, U.S. Marine Corps COL James R. Braden spoke about the demonstrations.

Braden made numerous points that struck a chord with audience members. Throughout his speech he supported forward thinking ideas with insight into the present and future of robotics. One issue presented focused on the fact that with new robotic inventions, the role of the human Soldier changes. The Soldier has to adapt to the new situation and his or her presence is still needed and valuable. “As soon as you have a robot operation, that Soldier is out of the fight,” Braden explained. “The only thing that Soldier is doing is operating the robot. So now, that Soldier needs what the Marine Corps calls a ‘guardian angel.’ He needs someone protecting him or her while operating that robot. That is something else we need to think about. As you design operating systems, how user-intensive are they? When you give up that Soldier you now have someone else protecting that Soldier.”

Engineers demonstrated five particular robotic systems during the demonstration: the Gladiator; Following Awareness, Safe-ops and Tracking Through Intelligent Ground Systems (FAST IGS); Tactical Amphibious Ground Support System – Common Experimental (TAGS-CX); Safe Operations T2 (SafeOps T2); and the Construction Engineering Robotics Kit.

The Gladiator, which is still under development, is excellent for missions where a compact, lightweight robot is needed. It is designed to support small, expeditionary units, maneuver sharply almost “turning on a dime” and reach speeds of up to 15 mph. This robot bears a top unit composed of two mounted cameras (two daylight, one infrared and one thermal), which are managed through the operator control unit. This platform also has a versatile



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mounting system for a light weapon. The Gladiator even has a microphone and a speaker to issue and listen for warnings.

The FAST IGS capability is a tracking Soldier instrumented radio that monitors and follows a Soldier's position. Situational awareness of Soldiers ensures the robot safely maneuvers along with the dismounted infantry. This latter feature is beneficial because the Soldier doesn't have to constantly backtrack to retrieve the robot. In the future, greater maneuverability – the ability to turn around at a faster pace in a constrained environment – is desired.

The Construction Engineering Robotics Kit has the same capabilities as similar UGVs and manned ground vehicles. TARDEC is helping to develop robotic excavating equipment to increase Soldier safety in a hazardous environment. The kit can perform a list of commands, such as removing debris and conducting day and night operations. Engineers hope that in the future there can be a switch that will allow operators to alternate between all mechanical functions.

TAGS-CX is one of many robots used for combat support. This robot can supplement a Soldier in a mission considered too dangerous, such as decontamination. Also, the platform may be configured to allow the use of commercial-off-the-shelf construction tools that can be used to assess robotic utility toward meeting engineer mission requirements. TAGS-CX has a telescopic mast that supports a communications system, including an antenna and camera. Other TAGS-CX capabilities include network connection and 360-degree situational awareness.

SafeOps T2 is a UGV that uses FCS team representative sensors to maintain situational awareness in highly cluttered and dynamic environments. It not only has the ability to track obstacles but to detect, track and predict in which direction an obstacle is heading. This ability helps to verify whether obstacles are friend or foe. In the future, it is hoped that SafeOps T2 can function in an array of challenging environments to ensure the safety of dismounted forces working in close proximity to UGVs, maintain safe travel distance and traffic lanes along improved roads and increase the level of autonomy to minimize warfighter interventions.

Attendees were able to view two additional robots on display: the MV4 and the Convoy Active Safety Technologies (CAST).

The MV-4 mini flail was built to clear various types of terrain. The mini flail, which is on the device's front, triggers mines as it is driven over them. Due to its low center of gravity it can access areas that bigger vehicles cannot.



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CAST was build to increase the level of safety by providing logistical support using a robotic convoy. It also offers situational awareness. Through this, CAST enhances the effectiveness and efficiency of a Soldier's mission.

“Through our work on robotic platforms, TARDEC is bringing new capabilities, new technologies and innovation to the warfighter,” concluded Bochenek. “Having autonomous systems and robots on the battle field will change the way we fight and will put fewer Soldiers in harm's way.”

Note: There are two photos available for use with this release. Caption information follows. To download the photo, go to <http://www.tardec.info/pressreleases/>.

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TARDEC-PR-0827_1_TAG-CX.jpg

TARDEC's Tactical Amphibious Ground Support-Common Experimental (TAGS-CX) robotic system was displayed at the Aug. 11 Detroit Arsenal robotics demonstration. The TAGS-CX is being designed for the Army's Future Combat Systems program for robotic bridge deployment and area route clearance. (U.S. Army TARDEC photo by Elizabeth Carnegie.)

TARDEC-PR-0827_2_Gladiator.jpg

TARDEC and RS JPO displayed the Gladiator's capabilities at the Aug. 11 Detroit Arsenal robotics demonstration. A tactical prototype of an unmanned multipurpose ground vehicle system, the Gladiator brings a scalable weapons response from less than lethal to lethal direct fire support for warfighters. (U.S. Army TARDEC photo by Elizabeth Carnegie.)

TARDEC is the Nation's laboratory for advanced military ground systems and automotive technology. A leading technology integrator for the U.S. Army Materiel Command's Research Development and Engineering Command (RDECOM), TARDEC is headquartered at the Detroit Arsenal in Warren, MI, located in the heart of the world's automotive capitol. TARDEC is a major element of RDECOM and partner in the TACOM Life Cycle Management Command. As a full life-cycle engineering support provider-of-first-choice for all DOD ground combat and combat support weapons and vehicle systems, TARDEC develops and integrates the right technology solutions to improve Current Force effectiveness and provide superior capabilities for the Future Force. TARDEC's technical staff leads research in ground vehicle survivability; mobility/power and energy; robotics and intelligent systems; maneuver support and sustainment; and vehicle electronics and architecture. TARDEC develops and maintains ground vehicles for all U.S. Armed Forces and numerous federal agencies.



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